



*This document is under review, if you have any input, please email safety@unsw.edu.au.

HS709 Materials Handling Guideline

Introduction

The handling of materials, either physically or mechanically, can introduce the risk of injury. The risks can be increased by inappropriate transport, handling or storage of materials, and inadequate systems of work. This guideline has been developed to help manage these risks.

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1. Scope

Local area procedures will outline the requirements for safe stacking heights, storage areas, speed limits, traffic management and such.

This guideline outlines the minimum standards and procedures for the safe implementation of materials handling at the UNSW. This document should be read in conjunction with the UNSW Manual Handling Guideline (OHS432).

2. Mechanised handling

Before purchasing any mechanical aid, the purchaser must be sure that:

- the item meets Australian Standards.
- the item has a load capacity suitable for the task.
- the load capacity is clearly marked on all lifting equipment.
- lifting equipment is only used for the load capacity and purpose intended.
- training requirements have been identified and licenses acquired before use of the item.
- Risk Management documents and Safe Work Procedures are in place prior to use.
- Identified controls are in place.
- The UNSW HS Purchasing Guideline (HS316) has been followed.
- No other uncontrolled hazards are introduced to the workplace (e.g., ignition source).

Use of mechanical aids to move materials should not place pedestrians at risk. Walkways for pedestrians should be clearly identified to minimise interaction between pedestrians and vehicles.

2.1. Forklifts

All forklift trucks must

- comply with AS 2359 Parts 1, 2 and 3.
- be fitted with:
 - a driver's overhead guard that is designed and constructed to provide reasonable protection for the driver from falling objects
 - Appropriate operator restraints
- have adequate mirrors, fully adjustable to provide all-round visibility.

Consideration should be given to the type of seating in relation to the operator and ergonomic comfort, including:

- seat height and depth;
- fabric covering;
- backrest height and angle;
- partial pivoting (if operators will spend long periods looking behind them);
- fore and aft movement;
- seat tilt;
- firm padding;
- vibration absorbing suspension.

A safe work procedure must be developed for the operation of the forklift for use in the area.

Competency

A certificate of competency (high risk work licence) must be obtained for all persons who use a forklift at the UNSW, before use of the forklift. The certificate of competency must be issued and assessed by a registered training organisation approved by WorkCover and evidence of renewal must be provided where appropriate.

Prior to use of any forklift at the University, the certificate of competency must be provided to the Project Manager or Area Supervisor.

Any incident, near miss or unsafe operation associated with the use of forklift must be reported to the Area Supervisor and HS Unit using the UNSW Health and Safety Online Reporting System via MyUNSW. Inappropriate behaviour with regards to the use of forklift may require the person to undergo further training and may necessitate the suspension of approval to use a UNSW forklift.

Forklift operation

Forklift drivers are required to comply with the practices and requirements as outlined in the Workcover NSW Forklift Truck Drivers Guide.

Forklift drivers:

- need to obtain permission from the appropriate Manager or Supervisor before using any forklift;
- must undertake pre-operational checks as described
- must adjust the seat so that all controls can be operated comfortably and safely;
- must adjust all mirrors for maximum visibility;
- must ensure there are no people in the vicinity of the vehicle;
- shall operate self-starter (where fitted) only from the driving position;
- shall not be under the influence of alcohol or drugs.

Vehicles shall:

- be driven safely, carefully, and sensibly at all times;
- be properly and securely parked before the driver dismounts.;

Vehicles shall not:

- be driven at excessive speed or above posted speed limits;
- carry passengers unless fitted with approved dual seating, which complies with the regulations;



- be driven on roadways with brake pedals uncoupled;
- be left whilst unattended and in gear with the engine running;
- be left with hydraulic implement raised or hydraulic system under load;
- be refuelled with the engine running;
- carry, lift, push or pull beyond manufacturer's specified limits.

Inspection and Maintenance

Records of forklift inspections and maintenance shall be retained according to the HS733 Health & Safety Records Procedure.

Inspection

UNSW forklifts are required to be inspected by the operator using a Forklift Truck Checklist on a 6 monthly basis. All breakages and non-functioning parts are to be reported as soon as possible.

Pre-operational checks of forklifts required by the operator include:

- Visual check:
 - for battery corrosion
 - for any obvious loose parts or materials
 - that the forks are free from cracks and defects;
- fire extinguisher fitted as required and ensure inspection date is current.
- Alarms are functioning
- any power take-off drives are properly guarded with fixed guard;
- Mirrors adjusted
 - Seatbelts are in good working order if fitted;
 - Warning lights and beepers are operational if fitted.

Other pre-operational checks include:

- steps and working platforms are free of any material that could cause potentially serious slips and falls;
- All workplace guards and warning signs are in place

Maintenance

UNSW forklifts are required to be maintained by a competent person according to AS2359.2, Section 6 and as per the manufacturer's recommendation.

2.2. Hand Truck (2-wheel trolley)

The following principles should be applied for the safe use of hand trucks:

- Load weight should be within the Rated Load (RL) of the particular trolley;
- Tip the load slightly forward so that the tongue of the hand truck goes under the load and then push the tongue of the hand truck all the way under the load;
- Load should be stable and have a centre of gravity not higher than the handle height;
- Keep the centre of gravity low by placing heavier and/or larger items below the lighter or smaller ones;
- Load height should be such that the operator has clear visibility in the direction of travel;
- Place the load so that it will not slip, shift or fall, and secure it with straps if they are required;
- Always wear enclosed footwear when using this equipment to move items;
- Path should be free of obstacles and be at least 1m wide;
- Load weight for single-person operation should not exceed 100kg;
- Push the load so that the weight will be carried by the axle and not the handle;
- Do not walk backward with a hand truck unless going up stairs or ramps;
- When going down an incline, keep the hand truck in front of you so it can be controlled at all times;
- Move hand trucks at a walking pace;
- Store hand trucks with the tongue under a pallet, shelf or table.

2.3. Hand Trolley (3-, 4-, 5-, 6-wheel trolley)

The following principles should be applied for the safe use of hand trolleys:

- Load weight should be within the RL of the particular trolley;



- Use a trolley that is designed in accordance with ergonomic guidelines;
- For 3-wheel trolleys, the load should be stable and have a centre of gravity not higher than handle height;
- Place the load so that it will not slip, shift, or fall, and secure it with straps if they are required;
- Always wear enclosed footwear when using this equipment to move items;
- Avoid lifting a loaded trolley over obstructions;
- If trolleys are pushed up a slope, the load should be reduced so that the recommended rolling force limit is not exceeded;
- Load height should be such that the operator has clear visibility in the direction of travel—if the view is obstructed, get a second person to assist;
- Load length should be such that the trolley and load are easily manoeuvrable, and can be readily stopped;
- use two persons to handle trolley loads longer than 4m to minimise the risk of injury from the high force required to stop the load suddenly and maintain its stability should it come into contact with other persons, or fixtures or items;
- Path should be free of obstacles and have good clearance for the trolley;
- Do not walk backward with a hand trolley unless going up ramps;
- When going down an incline, keep the trolley in front of you so it can be controlled at all times;
- Use a trolley fitted with brakes if required to stop on a ramp or regularly use a ramp;
- Move hand trolleys at a walking pace.

2.4. Hand Pallet Jack

The following principles should be applied for the safe use of hand pallet (electrical and manual) jacks:

- Load weight should be within the RL of the particular hand pallet jack;
- Load height should be such that the operator has clear visibility in the direction of travel. If the view is obstructed, get a second person to assist;
- Secure the load on a pallet or place it in a stillage so that it will not slip, shift or fall;
- Path should be free of obstacles and be at least 1.3m wide;
- If a T-handle is used, it should be long enough to protect the employee's feet from being struck by the pallet during pulling activities;
- If hand pallet jacks are pushed up a slope, the load should be reduced so that the recommended rolling force limit is not exceeded;
- Do not walk backward with a hand pallet jack unless going up ramps;
- When going down an incline, keep the pallet jack in front of you so it can be controlled at all times;
- Use a hand pallet jack fitted with brakes if required to stop on a ramp or regularly use a ramp;
- Move at walking pace;
- Start and stop the pallet jack gradually to prevent the load from slipping;
- Due to the wheel design, do not use hand pallet jack on gravel, damaged, or uneven surfaces;
- Always wear enclosed footwear when using this equipment to move these items;
- Never ride on hand pallet jacks.

2.5. Jib or Floor Crane

The following principles should be applied for the safe use of a jib or floor crane:

- Some occasions may require two people to operate the crane
- Always wear leather gloves and enclosed footwear when using this equipment;
- Ensure that the crane is fixed in place (for unmounted cranes) with all feet locked into position;
- Position the beam so that the chain block is directly above the mid-point of the object to be lifted;
- Position the ropes or slings around the object to be lifted such that the object can be lifted without slipping;
- Clip the chain hook through a free sling eye or, where the two sling eyes are coupled together with a D-shackle, clip the hook onto the shackle;
- While raising the load, the operator may need to manually balance the load.
- Carefully move the crane or beam so that the load hangs directly above the intended resting place and lower into place.
- Ensure crane and beam are out of the way and not creating a Health and Safety risk while not in use.
- A schedule to periodically inspect the sling(s) and the crane needs to be set up, with records of inspection maintained by the work area.
- Consideration should be given to licencing requirements for operators who are required to use judgement and assessment of a load for the selection of lifting equipment.



3. Materials Storage

3.1. Pallet racking

The following is required to be implemented for the safe use of pallet racking or steel storage racking (AS 4084: Steel storage racking):

- The safe working unit load or the safe working total load per bay for the racking installation shall not be exceeded;
- The racking installation shall not be altered to deviate from the load application and configuration furnished for the racking installation;
- Physical alterations to uprights, bracings, beams or components, such as welding on additional cleats or bearers, shall not be made. In addition, change of use, such as from timber pallets to post pallets shall not be permitted;

Safe work procedures including but not limited to the following content shall be provided:

- The correct application and use of the equipment;
- The safe working loads to be adhered to;
- Prohibitions on unauthorized alterations;
- Reporting:
 - any damage incurred due to impact so that its effect can be assessed in accordance with the tolerances (listed below);
 - Any hazardous situations which may exist in relation to the operation or maintenance of the racking installation;
 - Any damage incurred, however minor, so that its effect on safety can be immediately assessed.
- In the event of damage:
 - examine the extent of damage due to impact in the racking installation;
 - examine connectors for deformation or signs of cracking of the welds;
 - examine for any dislocation and deformation of sections and connections for uprights and beams;
 - examine out-of-plumb of the racking.
- Inspections shall be carried out on a regular basis, and at least once every twelve months to:
 - ensure the correct application and use of equipment;
 - ensure that the racking installation has not been altered;
 - ensure that the safe working loads are adhered to. (A copy of the load application and configuration drawings shall be retained for this purpose)

Acceptable tolerances for damage to racking (AS4084):

- Bracing - the member deviation from a 1 m long straight edge in either plane shall not exceed 10 mm;
- Beams - the permanent vertical deformation when unloaded shall not exceed L/800 and the permanent horizontal deformation shall not exceed L/500;
- Connectors - shall not show visible permanent deformation or signs of cracking of welds;
- Out-Of-Plumb Of Racking - The out-of-plumb of unloaded racking caused by impact shall not exceed the finished tolerances given in Table 4, factored by 1.5 of AS4084

4. Definitions

Competent person: a person who has acquired through training, qualifications or experience, or a combination of these, the knowledge and skill enabling that person to perform the task required.

Competency: demonstrated personal attributes and demonstrated ability to apply knowledge, skill and experience.

Forklift Truck: a powered industrial truck equipped with a mast and elevating load carriage to which is attached a pair of fork arms or other load-holding attachment. It does not include any pedestrian-operated forklift truck or a pallet truck capable of providing a maximum lift not exceeding 225mm.

Hand truck: A two-wheeled cart for moving heavy objects by hand, consisting of a vertical framework with handles at the top and a metal blade at the bottom that is inserted beneath a load. The entire assembly is then tilted backward until balanced for easy pushing or pulling.

Hand trolley: A multiple-wheeled cart for moving heavy objects by hand. Examples include flat bed, scissor lift, multi-tier trolleys

Hand pallet jack: A manually operated device for lifting and moving pallets. There are two basic designs: the single pallet jack, capable of selecting or moving one pallet per trip, and the double pallet jack, which can accommodate two pallets per trip. There are also electrical pallet jacks.

Jib crane: A cantilevered beam with hoist and trolley generally equipped with a winder (also called a wire rope drum), wire ropes or chains and sheaves, that can be used to lift and move large and/or heavy objects. Can be wall or floor mounted.

Manual Handling: is any activity requiring the use of force exerted by a person to lift, lower, carry, push, pull, hold or restrain any animate or inanimate object. It may also include stretching and bending, sustained and awkward postures and repetitive movements.

Material Handling: the mechanised transport, handling, or storage of single or multiple large, heavy, or bulky items.

Use: work from, operate, maintain, inspect, and clean.

5. Acknowledgements

- University of Wollongong
- AS2359.1. Powered industrial trucks: General Requirements
- AS2359.2: Industrial trucks: Operation
- AS2359.3. Powered industrial trucks: Counterbalanced forklift trucks – Stability Tests
- AS 4084: Steel storage racking
- Safe Work Australia Industrial Lift Truck Guidance Material [Link to guidance-industrial-lift-trucks](#)
- [Work Health and Safety Act 2011 \(nsw.gov.au\)](#)
- [Work Health and Safety Regulation 2017 \(nsw.gov.au\)](#)
- [List of codes of practice | SafeWork NSW](#)

Appendix A: History

Version	Authorised by	Approval Date	Effective Date	Sections modified
1.0	Director, Human Resources	2 July 2010	2 July 2010	New Document
1.1	Director, Human Resources	29 April 2013	29 April 2013	Minor changes to references Updated Branding Logo in accordance with UNSW Branding Guidelines. Modified the document identifier from OHS to HS in accordance with WHS legislation review
1.2	Director, UNSW Safety and Sustainability	30 April 2014	30 April 2014	Reviewed for administrative updates
1.3	Director, UNSW Safety and Sustainability	16 March 2016	16 March 2016	Reviewed for administrative updates Minor inclusions around Licensing requirements for using lifting equipment and Accessory inspections on forklifts.

2.0	Director, UNSW Risk & Safety Management	8 August 2022	8 August 2022	Administrative updates, template update and removed from Governance.
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Updates to this document

Any suggestions, recommendations or updates to this document should be emailed to safety@unsw.edu.au with the email header stating *GUIDELINES UPDATE HS709*.

